

one end. It seems likely that the adults had become activated by the warmer environment.

M. appendiculata was first recorded from Talkin Tarn by Pearce (1922). At that site, the host plant appears to be exclusively *M. alterniflorum* but at other sites in Britain cocoons of the beetle containing adults have been found attached to a number of other aquatic plants including *Potamogeton* spp., *Scirpus* spp., *Carex* spp., *Sparganium* spp., *Sagittaria*, and *Butomus* (Collins, 1911; Stainforth, 1944; Aubrook, 1948).

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Britain's newest and most northerly wasp population

Social wasps of the family Vespidae are only occasionally recorded in Shetland, Britain's most northerly land mass. Many records are anecdotal but they suggest that accidental importation, often in fruit, is the most common source of the records. However, records from ships at sea and from the remoter islands imply that natural vagrancy may occur. In the latter category are records of a Norwegian Wasp *Dolichovespula norwegica* (Fabricius) on Fair Isle on 22 August 1991 (Riddiford and Harvey 1992, *Ent. Rec.* 104: 263-264) and an unidentified wasp on Foula in June 1992 (S. Gear *pers. comm.*). A German Wasp *Vespula germanica* (Fabricius) found in fruit at Cunningsburgh in March 1993 (J. McKee *pers. comm.*) was unusual only in that anyone bothered to identify it. Talking to shop assistants anywhere in the islands reveals that wasps are amongst the commonest of the entomological surprises to be found in consignments of fresh produce.

In the summer of 1993 both Neil Marks and Harry Rose independently caught wasps free-flying in Lerwick which they identified as Common

Wasps *Vespula vulgaris* (Linnaeus). In September however KO, in his role as pest control officer for the Shetland Islands Council (SIC) Environmental Services Department, was notified of an active wasps' nest in Kveldsro Gardens, in central Lerwick. The nest was causing concern to the residents and required removal. Upon investigation the nest was found to be in the roof cavity of a single-storey house. The nest itself was inaccessible. After speaking to the resident of the house it transpired that the nest had been active since early summer and was supporting a healthy colony, as up to 20 individuals were being killed each day. A few specimens obtained were identified as *V. vulgaris* and a specimen from this nest has been placed in the National Museum of Scotland in Edinburgh. The nest was treated with insecticide, but as it was nearing the end of its breeding cycle it was thought unlikely to have much effect. Wasps, presumably from this colony, caused quite a nuisance in the shops of Commercial Street in central Lerwick in the autumn, where their unfamiliarity caused some consternation. At the time it was thought that this was the first proven breeding record of wasps in Shetland but in discussion with employees of the Housing Department it was revealed that they had removed an entire nest from a house at Sound on the outskirts of Lerwick in 1989. No specimens from this nest were retained but is believed that they were also Common Wasps.

In 1994 adult wasps were noted around Lerwick from late July onwards. The presence of nests was not confirmed until 28 August when one was reported from Knab Road, close to the location of the previous year's nest. Thereafter followed several reports of other nests, primarily as a result of the SIC requesting details of the location of any nests in the local newspaper. A total of 18 nests were discovered in Lerwick including one at the previous year's site. Ten nests were within a few hundred metres of the original site and seven more were strung out in an almost straight line up to a kilometre away. The remaining site was at Helendale on the far side of Lerwick, almost 2km distant. Located nests included eight situated in roof or floor spaces in buildings and ten in the ground. In addition there were several reports of Common Wasps entering houses in Scalloway (8km to the west of Lerwick) in 1994, suggesting at least one nest was in that area, but despite several requests for information on nest locations, none were found until the following spring when a dormant nest was located in an attic.

In 1995 a total of 40 nests in Lerwick were reported to the Environmental Services Department of the Shetland Islands Council. There was a suggestion that there were fewer nests around the original site (although this site itself was still in use) although possibly established nests were not being reported again. Most nests reported in 1995 were further west, away from the shopping centre and in a suburban area with larger gardens. There were also ten nests around Helendale on the western edge of Lerwick. All nest sites were recorded in 1995, 13 were in roof or floor spaces in buildings and

the remainder were in holes in the ground. More unusual sites were in a barrel and in a pile of peats (which are used as fuel in Shetland). Elsewhere there were further reports of wasps in Scalloway in 1995, and although again no certain nest site could be found they were common around any gardens in the village with established trees.

It would appear that all subsequent nests were founded by queens produced from the original nest. The origins of the original queen is uncertain. Common Wasps have colonised Orkney since 1986 and there are also breeding records of Norwegian Wasp *Dolichovespula norwegica* (Booth 1994, *The Orkney Naturalist* **1994**: 54). The spread of certain Continental wasps into southern Britain has received much attention in recent years (see for example Else 1994, *British Wildlife* **5**: 304-312). Perhaps we are seeing a similar spread of a more familiar species at the opposite end of Britain. It would be interesting to know if there has been any expansion of range by any wasp in Scandinavia. The location of the original nest near the shopping centre of Lerwick, and the apparent move away from this area to more suitable areas since then, lends support to the theory that the original queen arrived in fresh produce. However, the fact that the wasps have managed to become established is a suggestion of climatic change.

What of the future for this most northerly (and in the eyes of most Shetland residents, unwelcome) wasp population? Two unusual sets of weather conditions may help explain their successful colonisation. Recent winters have been, by Shetland standards, relatively cold with fairly frequent snow. Such conditions increase the likelihood of successful hibernation as they reduce the damp, mild conditions which encourage fungal infections in hibernating insects. In addition, the last two summers have been relatively warm and sunny (again, judged by Shetland standards), which can have only been beneficial to heat-loving Hymenopterans such as wasps.

It looks likely that the best efforts of the Environmental Services Department will be in vain as most nests are only reported to them, and hence treated, after the new batch of queens have departed. The increase in the known population from one nest in 1993 to 18 in 1994 to 40 in 1995 reveals the ineffectiveness of treating nests late in the season. Obviously the wasps carry out much of their life cycle without drawing attention to themselves or causing any nuisance. A return to the sort of weather Shetland experienced during the 1980s, with mild, wet and windy winters, may prove to be a more effective control measure. These conditions would make fungal infections of hibernating queens more likely. However, it would appear that wasps have already established a strong foothold in Shetland's two main centres of population.— M.G. PENNINGTON, Shetland Entomological Group, 9 Daisy Park, Baltasound, Unst, Shetland ZE2 9EA; K. OSBORN, 20 Nederdale, Lerwick, Shetland ZE1 0SA and J.D. OKILL, "Heilinabretta", Cauldhame, Trondra, Shetland.